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AUTHOR Atkins-Sayre, Wendy; Hopkins, Sonya; Mohundro, Sarah; Sayre, Ward

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ABSTRACT

This study is presented as an exploratory research effort regarding students' perceptions of PowerPoint presentations used by college instructors in a basic Fundamentals of Public Speaking course. Data were collected to determine the outcomes in four primary areas: General Questions about PowerPoint use; Perceived Effectiveness of PowerPoint; Demographics of the Respondents; and Student Preference for Future Use. Four hundred and eighty-five (N=485) surveys were collected from participants. Respondents ranged in age from 17-57 years old with a mean age of 24. Results indicated that: (1) 29 percent of the students had been exposed to PowerPoint in other classes, and 33 percent had given presentations using it; (2) students had a higher effect for classes using PowerPoint as a lecture tool; (3) 69 percent of the students perceived PowerPoint as a cognitive aid; and (4) the use of the technology significantly increased the desire for Hispanic students and English-as-a-second-language students to want to see the technology used in other classes. (Contains 7 references and 4 tables of data; the survey instrument is attached.) (Author/RS)

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ED 430 260

Rewards and Liabilities of Presentation Software as an Ancillary Tool:

Prison or Paradise?

Presented to the National Communication Association Eighty Fourth Annual Convention

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By

Wendy Atkins-Sayre

Sonya Hopkins

Sarah Mohundro

Del Mar College
Department of Communication
101 Baldwin
Corpus Christi, Texas 78404

Ward Sayre, Ph.D. candidate

University of Texas
Department of Economics
Austin, Texas 78712

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ABSTRACT

This study is presented as an exploratory research effort regarding students' perceptions of PowerPoint presentations used by college instructors in a basic Fundamentals of Public Speaking course. Data was collected to determine the outcomes in four primary areas: I) General Questions about PowerPoint use, II) Perceived Effectiveness of PowerPoint, III) Demographics of the Respondents, IV) Student Preference for Future Use. Four hundred and eighty-five (N=485) surveys were collected from participants. Respondents ranged in age from 17-57 years old with a mean age of (X=24).

INTRODUCTION

It takes no great deal of observation to note that technology is making a significant presence in college classrooms across this country. At each Speech Communication convention, one finds a multitude of panels addressing this creeping presence. The question that we, as a discipline, are now dealing with is how to most effectively utilize presentational technology as we teach students. One of the most prevalent types of technology being used in the classroom is different types of presentational software. Microsoft PowerPoint, for example, is a popular choice of lecture aids. As more and more colleges and universities are spending thousands of dollars acquiring the equipment to run this software in the classroom and as more professors are spending countless hours learning the software and creating lecture presentations, the question becomes more pressing.

Thus, the motivation for this research was to confirm the popular belief that PowerPoint, as well as other desktop presentational software, is a valuable teaching tool. In reviewing the literature, we found that very little has been written about presentational software effectiveness in the classroom. This lack of literature seems to highlight an area which calls for examination. It is important to note that this study was intended to be a pilot project. The intention is to find some validity in the belief that PowerPoint is an effective teaching tool and to find areas for

further examination. Thus, this paper will report the findings of the study and suggest areas for further research.

The study was formulated around four main research questions: 1) Does PowerPoint have a significant effect on the students' perception of instructor credibility and delivery skills? 2) Does PowerPoint have a significant effect on the students' perception of their understanding and retention of the information? 3) Does the use of PowerPoint in the classroom have a significant effect on the students' desire for future use of the software? 4) Does any particular demographic group have a significant affinity for PowerPoint? These questions were used in formulating the questionnaire and in analyzing the data. This paper is presented in four main sections: literature review, methodology, results, and discussion.

LITERATURE REVIEW

The research regarding technology in the classroom delves primarily into distance learning. There are several papers addressing the use of the Internet and the World-Wide Web as substitutes for conventional classroom settings (Banks, 1998; *Chronicle of Higher Education On Line*, 1998a; 1998b; Koch, 1998), but little has been written about the use of computer technology as a teaching tool *within* the classroom setting.

Studies which *do* examine the use of technology within the classroom have made some interesting discoveries regarding various demographics such as age and gender as they relate to the use of computer technology in academia. One article in *The Chronicle of Higher Education On Line* dated September 11, 1998 disproved the assertions made in a previous article dated October 31, 1997 which surmised that women would be less likely to enjoy and/or benefit from the distance learning environment. To the contrary, the September 11, 1998 article found no

significant difference in either the perceptions or the performance of men and women in distance learning classes. Comber, et. al (1997) provides further evidence that gender no longer plays a significant role in attitudes and aptitudes toward computer use in the classroom. They assert that the differences in student success in the technology based classroom can more accurately be attributed to prior computing experience. Statistics may show women to have higher anxiety when in technology driven classes, but after controlling for prior experience, differences in computer interest were no longer significant (Chen, 1996).

Some papers written in disciplines other than Speech Communication address the use of PowerPoint as a teaching tool (Daniels, 1998; Holzl, 1998; Crosby, 1994; Ekhaml, 1994; Priestly, 1991). Daniels (1998) reports her findings regarding the benefits and costs of using PowerPoint in Economic Theory courses. This paper lists the visual attraction for the students as the primary benefit of using desktop presentation programs citing the color, animation and graphics as enhancing the lecture material. Another benefit mentioned is the organization of lecture notes for the students. Daniels states that printing out the slides and distributing them to the class improves their ability to stay on track with the lecture material. The primary benefit for instructors is the ability to review material from a previous class quickly by running through the slides before beginning a new lecture.

Daniels also discovered that there was no significant difference in students' cognitive performance between those classes which used PowerPoint and those which did not. However, the attitude of students and their overall perception of classes using PowerPoint was significantly higher. Students indicated a preference for the PowerPoint slides over the chalkboard and reported the slides to be "somewhat to extremely useful" (Daniels, 1998, p. 9).

Although PowerPoint is certainly used by speech instructors as an instructional aid for lecture material, PowerPoint is also utilized by the student as a presentational aid. Students are encouraged to explore the most current technology in the preparation of visual aids for their class presentations. Therefore, this paper will examine students' perceptions of PowerPoint as a counterpart to the lecture material presented by the instructor and how this may or may not influence their choices to utilize PowerPoint in their own presentations.

METHOD

Participants

The sample for this preliminary study consisted of four hundred and eighty-five (N=485) subjects enrolled in a freshman level Fundamentals Of Public Speaking course at Del Mar College (a community college located in Corpus Christi, Texas). The students participated in this study as part of their daily class activities. Six full-time instructors distributed the survey (see Appendix A) to three [±] sections of their students. Each instructor allowed approximately 20 minutes for the respondents to complete the survey. Four (4) of the sections were selected as a control group. Students in the control group (N=73) had not observed the use of a PowerPoint presentation while enrolled in the Fundamentals of Public Speaking course.

The subjects responding to this survey ranged in age from 17 to 57 years old. The mean age of the respondents was twenty-four (24) years old. The subjects represented a diverse ethnic background which included: Hispanics (N=226), Anglos (N=195), African-Americans (N=11), Asians (N=10), and an Others option (N=18). Ten percent of the respondents classified themselves as speaking English as a Second Language (ESL). Sixty-nine percent (N=323) were female while thirty-one percent (N=135) of the subjects were male. Sixty-eight percent (N=318) of the subjects reported that they owned a home computer.

Measures

All variables investigated in this research are represented on a questionnaire consisting of forty-one (41) items. The questionnaire is divided into four parts: I) General Questions about PowerPoint, II) Perceived Effectiveness of PowerPoint, III) Demographics of Respondents, IV) Preference for Future Use.

General Questions

The questions in this section were developed to obtain information from the respondents about two important factors: the amount of exposure they had experienced with PowerPoint and their perceptions of the communication context when PowerPoint was used. To determine the amount of exposure to PowerPoint, items 02, 03, and 04 were used. Item 05 identified students who had created a PowerPoint presentation of their own.

Perceived Effectiveness Questions

Items 10-17 addressed the issues of the instructor's delivery style (did it enhance the delivery style or add interest to the lecture). Perceived credibility of the instructor was also measured based on the use of PowerPoint in the classroom. Items 18 and 19 focused on the subjects' perceived understanding and retention of the course material. All items in this section were measured on a five-point Likert-type scale, ranging from "Strongly Disagree" to "Strongly Agree."

Preference for Future Use

Items 20 and 21 allowed respondents to provide feedback regarding their affinity toward the use of PowerPoint in the classroom. The researchers asked question 20 to verify if an instructor's use of PowerPoint would increase the student's desire to learn how to use the presentational software. Question 21 asked the respondents if they would like to see more

instructors use PowerPoint across disciplines. Both items were measured on a five-point Likert-type scale, ranging from "Strongly Disagree" to "Strongly Agree."

Demographic Information

Questions in this section were constructed to find out as much as possible about the sample population. Therefore, the demographic data was extended to include information about ownership of a home computer, access to PowerPoint (outside of the college), current grade point average, computer classes previously taken, etc. This section of the questionnaire solicited both open and closed responses from the participants. Items 22, 24, 25, 32, 33, 35, 36, 37, 38, 41 were forced-choice type questions (yes/no, male/female, grade expected in the course, etc.). Items 28, 30, 34 were forced-choice questions with dependent open-ended queries. Items 23, 26, 27, 38, 39, 40 were open-ended questions that were later grouped and coded during data entry.

Dependent Variables

Indices were created to operationalize the concepts of instructor credibility, perceived effectiveness, and preference for future use. The survey questions which comprise each of these indices are (as shown in Appendix A): perceived instructor credibility—Items 10, 11, and 12; Perceived effectiveness—Items 18 and 19, preference for future use—Items 20 and 21. Chronbach's reliability coefficient alpha, which shows the consistency of answers with a measure, for these three measures are: perceived instructor credibility (.90) , perceived effectiveness (.89), and preference for future use (.77). Generally, values of greater than (.6) are seen as acceptable, while values greater than (.8) are considered very reliable. These three measures all have Chronbach's alphas greater than (.6) while two of the three are greater than (.8). Each of these indices is standardized such that it takes a value between zero to one, so that

the effect of the independent variables is measured consistently across the regression models below.

Independent Variables

Frequency of PowerPoint use was operationalized through a Likert-type scale from 1 to 4 representing whether the instructor: never (1), rarely (2), occasionally (3), or weekly (4) used PowerPoint during lectures. Demographic variables were measured as customary. Age is measured in years. Measures for Hispanics, females, students with disabilities, and ESL students are coded with a one if they are in this category all others are coded with a zero value.

Statistical Analyses and Design

Ordinary least squares regressions were used in order to measure the effect of these independent variables on the measures of perceived instructor credibility, perceived effectiveness of the instructor, and preference for future use. This technique measures the multiple correlation between the independent variables and the dependent variable. Since these measures are normalized to be between zero and one, a rough approximation to continuity is made and ordinary least squares regression is appropriate.

Based on the hypotheses presented in the Review of Literature, we designed a survey which was pre-tested in the Spring of 1998 with students enrolled in Fundamentals of Public Speaking course. Based on the pre-test responses, slight modifications were made. Modifications included adding several questions and altering the wording to enhance clarification.

RESULTS

The results of the study were not very shocking. They do, however, give some validity to the claims that we have been making about the use of PowerPoint (and other types of presentational software) in the classroom. That is, the results confirm the fact that PowerPoint seems to be an effective teaching tool. See Tables 1 through 4 at the end of this paper for a summary of the results.

Frequency

The first section of questions to be addressed is the "General Questions about PowerPoint". Surprisingly, only twenty-nine percent (N=141) of the surveyed students had seen PowerPoint used in other classes. For roughly two-thirds of the audience this was their first exposure to the technology. Thirty-three percent (N=160) of those surveyed had made a presentation using PowerPoint themselves.

The second section of questions to be addressed is the "Questions Regarding the Perceived Effect of PowerPoint." This group of statistics most poignantly shows that PowerPoint is a worthwhile tool in the classroom. Seventy-two percent (N=349) of those surveyed reported that they "Agreed" or "Strongly Agreed" that PowerPoint enhanced the instructor's delivery and sixty-nine percent (N=335) reported the same regarding PowerPoint's enhancement of their instructor's credibility. It is important to note that the remaining responses generally fell into the "Neutral" category.

Seventy-three percent (N=354) of the respondents felt that PowerPoint helped them to maintain interest in the lecture. Sixty-nine percent (N=335) said that PowerPoint enhanced their understanding of the material. Sixty-eight percent (N=330) said that PowerPoint helped them to

retain the material. It is significant to note that the students perceived themselves to have higher self-efficacy when exposed to PowerPoint.

In the fourth set of questions, "Preference for Future Use", sixty-seven percent (N=325) felt that the use of PowerPoint in the classroom made them want to learn to use the technology. Seventy-one percent (N=344) of those surveyed wanted to see PowerPoint used in future classes.

Regressions

Ordinary least squares regressions were run in order to understand the relationships between the variables. Specifically, we were interested in how demographics and other covariates that might affect attitudes impact 1) measures of instructor credibility and effectiveness, 2) understanding and retention, and 3) future use of PowerPoint.

When looking at the effect of these variables on credibility/effectiveness, only two variables are significantly related: frequency of use and Hispanics. Frequency of use was positively and significantly related (p=.00). Interestingly, Hispanic students were more likely to believe that PowerPoint affected the credibility/effectiveness of the instructor than non-Hispanics (p=.03). While not as significant, female respondents also rated PowerPoint as being a contributor to the credibility/effectiveness of the instructor (p=.07).

When examining the effect of these variables on understanding and retention, only one variable was significantly related. The frequency of use of PowerPoint was a significant contributor to the understanding and retention of information (p=.00).

Finally, this study examined the effect of the variables on future use of PowerPoint. Here we found a great deal of significant results. The study found that the frequency of use of PowerPoint significantly increased students' desire to see PowerPoint used in the future and to want to use it themselves (p=.06). Hispanic students and ESL students also reported that they

would like to see future usage, more than other demographic groups (Hispanics p= 05, ESL p= 04). Although the result is certainly not as significant as previously reported statistics, it is worth noting that women seemed to report a greater desire for future use of PowerPoint (p= 18)

DISCUSSION

This study gathered student perceptions of PowerPoint as exploratory research to begin the discussion of PowerPoint as a teaching and learning tool in the Speech Communication classroom. As such, it has answered questions with regard to the strengths and weaknesses of the instructor's use of PowerPoint as a teaching tool and indicated the impressions made on students by exposure to this type of desktop publication presentation software. As stated in the introduction, the initial predictions of most instructors was that the integration of technology into the classroom would have a positive impact on student learning. This study partially supports this idea.

Benjamin S. Bloom's (1976) book, *Human Characteristics and School Learning*, offered three independent variables in his theory of classroom learning which is still widely accepted today: 1) student ability, 2) student motivation, and 3) quality of classroom communication. He determined that the outcomes, or dependent variables are the degree to which a student acquires specific knowledge (cognitive learning), skills (behavioral learning), and/or attitudes (affective learning). It seems that research involving technology in the classroom has followed this pattern.

The first section of questions determined student's exposure to PowerPoint. Although college administrators are urging instructors to utilize technology in their classrooms, only one-third of the students surveyed had ever been exposed to PowerPoint in any of their classes. Amazingly, approximately the same number of students had made presentations using

PowerPoint themselves. This statistic implies that once exposed to the technology, students may desire to learn to use the technology themselves thus illustrating the impact of PowerPoint on *behavioral learning*.

The second section of the study has supported the findings of Daniels (1998) which imply that students do have higher *affect* for classes utilizing PowerPoint as a lecture tool. This study overwhelmingly indicated an increase in both instructor-delivery and instructor-credibility as perceived by the students (72% and 69% respectively). This directly parallels Daniels' (1998) finding that, "...student reaction to Desktop Presentation Program materials was overwhelmingly positive" (p. 11).

The third section of the study reflects the *cognitive dimension* of Bloom's theory. A large percentage of the respondents perceived PowerPoint as a cognitive aid by 1) maintaining interest in the lecture (73%), 2) enhancing their understanding of the material (69%), and 3) helping them to retain the material (68%). It is important to note that no tests were given to measure actual cognitive response to the use of PowerPoint and that these numbers are merely a reflection of the student's perception of their own learning. The true test of these statistics would be to control one section for the use of PowerPoint to see if test grades increased significantly. Past studies have shown no difference between grades in classes that were or were not exposed to PowerPoint (Daniels, 1998). It is significant, however, that the students perceived themselves to have higher self-efficacy when exposed to PowerPoint.

The use of PowerPoint in the classroom does seem to have a positive influence on students' desire to see this technology used in other classes (71%) and on their interest in utilizing the technology themselves (67%). These statistics are inspiring, given the explosion of the use of presentational software in the business world and other professional realms.

When examining the regression results, it is obvious that frequency of use of PowerPoint had the most significant effect on increased credibility/effectiveness, perceived understanding and retention, and affinity for future use. Thus, as instructors use the technology more frequently, students perceive them to be more effective teachers and react more positively to the technology.

The future usage section brought out some interesting findings. The use of the technology significantly increased the desire for Hispanic students and ESL students (and female students, to a smaller degree) to want to see the technology used in other classes and/or to want to use it themselves. However, this study did not discover a reason for this response.

Given the above findings and the fact that Hispanic students and female students felt that the use of PowerPoint significantly increased the credibility/effectiveness of the instructor, it seems that there were some differences among demographic groups and the way that they react to PowerPoint in the classroom.

Limitations

This exploratory study is limited in several ways. One of the primary limitations includes a relatively small control group. A larger more defined control group may have offered unique insights on the four concentrated areas of this research.

A second limitation exists in the survey developed for this project. More questions could have been included to compare the preferential differences in the types of visual aids instructors used during lectures. If the control group had never seen a PowerPoint presentation used as an instructional tool it would be interesting to know which visual aid they preferred. For instance, respondents might rank other types of visuals as effective in enhancing learning/retention of the

material which could then be compared to PowerPoint presentation formats to see if there was a significant difference.

A final limitation involves streamlining the process of how each instructor distributed the survey to the respondents. Some instructors administered the survey at the beginning of the class session while others distributed it at the end of class. Some of the instructors read the paragraph at the top of the survey and others did not. The amount of time allotted for each section varied between instructors.

Suggestions for Future Research

This study was designed to ignite the discussion of the use of presentational software in the classroom. The findings of this questionnaire present several possibilities for future research. First, there should be further research into the cognitive effects of the use of PowerPoint in the classroom. While the Daniels (1998) study began this work, further research should work with control groups in order to examine any differences between understanding and retention of material. This study was only able to test the perceived impact upon understanding and retention.

Second, there should be further research into the differences between the use of PowerPoint in the classroom versus other types of visual aids. This study obviously focused on this one type of visual aid. Further research may find that it is visual aids in general, not just PowerPoint, which is significantly impacting credibility, understanding, retention, etc.

Third, there were some interesting findings on the impact of PowerPoint on female students, ESL students, and Hispanic students. This study does not make any significant claims regarding those findings. Further research should be conducted in order to make final judgements about the impact on these demographic groups.

The findings of this paper are significant in that they fill a void in the literature regarding technology in the classroom. It is our hope that scholars will be able to use this research to justify the time and money spent in integrating PowerPoint into the classroom. The study is exploratory by nature, however the findings provide a foundation for future studies. While the use of PowerPoint continues to grow in the classroom as well as the public sector, it is important that we continue to ask the questions which will allow an understanding of how to best utilize this form of technology. This paper is a starting point for that inquiry.

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TABLES

Table 1. Descriptive Statistics

PowerPoint is the visual aid most often used	58%
Instructor used PowerPoint weekly	45%
	Percentage of students who
had Seen Powerpoint used in other classes	29%
had created a Powerpoint presentation	33%
were bothered by lights being off	5%
were bothered by Powerpoint	2%
	Proportion of Students who agreed or strongly agreed
PP enhanced instructor's delivery	72%
PP enhanced instructor's credibility	69%
PP helped keep student's interest	73%
PP more effective than other visual aids	72%
PP made the instructor go too fast	15%
PP made the instructor go too slow	5%
PP restricted the movement of the instructor	14%
PP enhance my understanding of the material	69%
PP helped me retain the material	68%
Seeing PP made me want to learn how to use it	67%
I would like to see more instructor's use PP	71%
Demographics	
Female	69%
Hispanic	48%
ESOL	10%
Disabled	6%
Average Age	24
Own a computer	68%

Table 2. Effect of variables on Credibility and Effectiveness Measure

Variable	Coeff	Standard Error	P
Frequency of PP use	.048	.011	.000
Hispanic	.044	.020	.030
Age	-3.70e-4	.001	.783
ESL	.023	.035	.652
Computer	-.011	.021	.607
Female	.038	.021	.069
Disability	.044	.047	.347

Table 3. Effect of variables on Understanding and Retention

Variable	Coeff	Standard Error	P
Frequency of PP use	.084	.011	.000
Hispanic	.022	.020	.271
Age	-3.1e-4	.001	.811
ESL	.036	.033	.271
Computer	-.018	.020	.370
Female	.025	.020	.215
Disability	.016	.046	.733

Table 4. Effect of variables on Future Use

Variable	Coeff	Standard Error	P
Frequency of PP use	.021	.011	.060
Hispanic	.041	.021	.052
Age	.001	.001	.437
ESL	.071	.035	.042
Computer	-.015	.021	.493
Female	.029	.022	.177
Disability	.003	.045	.949

APPENDIX A

Del Mar Communications Department
PowerPoint Survey

We would like to thank you for your help in studying the effectiveness of this teaching tool. The results of this survey will be used in a paper presented before the National Communication Association national convention. Please answer as specifically as possible. Thanks again for your time.

Setup Questions:

1. What type of visual aid is most frequently used by the instructor in your class?

❑ PowerPoint ❑ Overhead ❑ Chalkboard ❑ Other(specify)

2. How frequently did your speech instructor use PowerPoint?

❑ never ❑ rarely ❑ occasionally ❑ weekly

3. If weekly, approximately how many times per week? _____

4. Have you seen PowerPoint used in other classes? ❑ Yes ❑ No

5. Have you ever created a PowerPoint presentation? ❑ Yes ❑ No

6. Does having the lights off in the room bother you? ❑ Yes ❑ No

7. Does the PowerPoint equipment bother you? ❑ Yes ❑ No

8. Where do you sit in the room? (front, back, etc.) _____

9. Was it easy to read the screen? ❑ Yes ❑ No

Effectiveness Questions:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10. I feel that the use of PowerPoint enhanced my instructor's delivery.	1	2	3	4	5
11. I feel that the use of PowerPoint enhanced the credibility of my instructor.	1	2	3	4	5
12. I feel that the use of PowerPoint helped keep my interest.	1	2	3	4	5

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	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13. I feel that the use of PowerPoint was more effective than other visual aids (chalkboard, overhead transparencies, etc.).	1	2	3	4	5
14. I feel that the use of PowerPoint made the instructor go too fast through the material.	1	2	3	4	5
15. I feel that the use of PowerPoint made the instructor go too slowly through the material.	1	2	3	4	5
16. I feel that the use of the equipment restricted the movement of the instructor.	1	2	3	4	5
17. (If you feel the movement was restricted) The restriction bothered me.	1	2	3	4	5
18. I feel that the use of PowerPoint enhanced my understanding of the material.	1	2	3	4	5
19. I feel that the use of PowerPoint helped me retain the material.	1	2	3	4	5

Future Use Questions:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20. I feel that the use of PowerPoint in the classroom made me want to learn how to use it.	1	2	3	4	5
21. I would like to see more instructors use PowerPoint.	1	2	3	4	5

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Demographics

22. What kind of class is this? ❑ Speech 1315 ❑ Speech 1321

23. Who is your instructor? _____

24. What is your gender? ❑ male ❑ female

25. What is your ethnicity?
❑Anglo ❑Hispanic ❑African-American ❑Asian ❑Other (specify)

26. What is your major? _____

27. What is your age? _____

28. Do you speak English as a second language? ❑ Yes ❑ No

29. If so, what is your first language? _____

30. Do you have any type of disability? ❑ Yes ❑ No

31. If so, please specify. _____

32. Have you ever taken a computer class? (e.g. computer programming) ❑ Yes ❑ No

33. Do you own a computer? ❑ Yes ❑ No

34. If you own a computer, is PowerPoint installed on that computer? ❑ Yes ❑ No

35. If so, what version do you have? ❑ Earlier than 4.0 ❑ 4.0 ❑ 7.0 ❑ Later than 7.0 ❑ Don't know

36. Do you have access to PowerPoint outside of the school? ❑ Yes ❑ No

37. What grade do you expect to make in this class? ❑ A ❑ B ❑ C ❑ D ❑ F

38. What is your grade point average? _____

39. How many hours are you taking this semester? _____

40. How many hours per week do you work in all jobs (including work/study)? _____

41. What is your total family income per year? (Include parents'/spouse's income if you live with them.)
❑ Less than $20,000 ❑ $20,000-$39,999
❑ $40,000 - $59,999 ❑ $60,000-$79,999
❑ $80,000 - $99,999 ❑ $100,000 +